

CLAIMS

1. A method for forming a multilevel structure on a surface, the method comprising the steps of:

depositing a curable liquid layer on the surface;

5 pressing a stamp having a multilevel pattern therein into the liquid layer to produce in the liquid layer a multilevel structure defined by the pattern; and,

curing the liquid layer to produce a solid layer having the multilevel structure therein.

10 the method further comprising, prior to the pressing, aligning the stamp relative to the surface via complementary formations on the stamp and the surface, wherein the aligning comprises lubricating movement of the stamp relative to the surface via the liquid layer and wherein the complementary
15 formations comprise protrusions on one of the stamp and the surface and recesses for receiving the protrusions on the other of the stamp and the surface;

wherein the aligning comprises stretching the stamp.

2. The method as claimed in claim 1, wherein the protrusions
20 are offset relative to the corresponding recesses to produce deformation of the stamp.

3. The method as claimed in claim 1, wherein the depositing comprises depositing an excess of the liquid comprising the liquid layer on the protrusions.

4. The method as claimed in claim 3, wherein the aligning
5 comprises expansion of the recesses in the direction of the offset when brought into contact with corresponding protrusions, the elasticity of the stamp providing an exit path for the excess liquid and allowing each recess to close around a corresponding protrusions.

10 5. The method as claimed in claim 1 wherein the solid layer is formed from a dielectric material and the multilevel structure comprises a multilevel cavity in the solid layer.

6. The method as claimed in claim 1 wherein the solid layer is formed from a resist material, the multilevel structure
15 comprises a multilevel cavity in the solid layer, and the depositing comprises depositing a resist material in liquid form on a dielectric layer.

7. The method as claimed in claim 6 further comprising etching the dielectric layer via the solid layer to transfer the
20 cavity from the solid layer to the dielectric layer.

8. The method as claimed in claim 5 further comprising depositing metal in the cavity to produce a conductive structure embedded in the dielectric material.

9. The method as claimed in claim 8 further comprising
5 performing thiol printing on the dielectric layer, thereby to prevent deposition of metal outside of the cavity.

10. The method as claimed in claim 8 wherein the cavity comprises a first level corresponding to a longitudinal element of the conductive structure and a second level corresponding to a
10 lateral element of the conductive structure.

11. The method as claimed in claim 10 wherein the longitudinal element comprises a via for completing an electrical connection between adjacent levels of a multilevel interconnection structure for an integrated circuit, and the
15 lateral element comprises a wire for completing an electrical connection with one of the adjacent levels of the integrated circuit.

12. The method as claimed in claim 1 wherein the curing comprises exposing the liquid layer to ultraviolet light via the
20 stamp.

13. A method for fabricating an integrated circuit having a multilevel interconnection structure, the method comprising between at least one pair of adjacent levels of the interconnection structure, forming an electrically conductive
5 structure by performing a method comprising the steps of:

depositing a curable liquid layer on the surface;

pressing a stamp having a multilevel pattern therein into the liquid layer to produce in the liquid layer a multilevel structure defined by the pattern; and,

10 curing the liquid layer to produce a solid layer having the multilevel structure therein.

the method further comprising, prior to the pressing, aligning the stamp relative to the surface via complementary formations on the stamp and the surface, wherein the aligning
15 comprises lubricating movement of the stamp relative to the surface via the liquid layer and wherein the complementary formations comprise protrusions on one of the stamp and the surface and recesses for receiving the protrusions on the other of the stamp and the surface;

20 wherein the aligning comprises stretching the stamp.